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FINAL
North of Wood Street Monitoring Summary Report 2007 Remedial Dredging

Environmental Monitoring, Sampling, and Analysis

New Bedford Harbor Superfund Site

New Bedford Harbor, MA

FINAL REPORT

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2007 Remedial Dredging

Environmental Monitoring, Sampling, and Analysis
New Bedford Harbor Superfund Site
New Bedford Harbor, MA

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EXECUTIVE SUMMARY

Environmental sampling and analysis was performed at the North of Wood Street (NWS) area in November and December 2007 in support of remedial dredging activities at the New Bedford Harbor Superfund Site. In 2002-2003 approximately 15,000 cubic yards of material was removed from the NWS area. The NWS area was remediated using a dry excavation method to eliminate the potential for sediment resuspension and recontamination. Annual investigations have been conducted since 2004 to assess the effectiveness of prior remediation and potential recontamination of this area due to sediment transport from unremediated areas. Post-remediation sampling conducted in 2004 identified a shoreline area in Acushnet that should have been included in the 2002–2003 cleanup but which was inadvertently missed (this missed area was then remediated in 2005). Additional studies in the NWS area are planned for 2008.

Twenty-one stations in the NWS area were sampled in 2007, including 14 river sediment locations and 7 marsh soil locations along the eastern and western shores of the river. River sediments were generally comprised of a layer of fine black silt underlain by sand, clay or silt. River sediments located closer to the shore and further upstream were comprised of brown organic sand and silt underlain by gravel and/or sand. Shoreline soils were generally comprised of brown organic silt and sand underlain by sand or gravel, silt and sand.

In 2007, total PCB concentrations in river sediment samples ranged from 0.4 milligrams per kilograms (mg/kg) to 270 mg/kg dry weight. The highest concentrations of total PCB (>100 mg/kg) were measured in sediment at stations C007-039, C007-055, and C007-033. The lowest concentrations (<5 mg/kg total PCB) were measured in sediment collected closer to the shoreline and further upstream. Total PCB concentrations were below the applicable recreational cleanup criteria (25 mg/kg) at all shoreline locations in 2007.

Sediment data from the 2003–2007 monitoring period show that total PCB concentrations in river sediment at the NWS area are spatially and temporally variable, which may reflect differences in bulk sediment characteristics and the highly dynamic nature of the system. Total PCB concentrations in 2003 were among the lowest measured during the monitoring period. Total PCB concentrations increased at most stations following the remediation of the NWS area in the winter of 2002-2003. The post-remediation increase was relatively small at some stations (C007-016, 023, 040, 049, 062) and larger at others (C007-028, 033, 038, 039, 048, and 055). The apparent increase could have resulted from contaminant transport from the upper harbor during dredging activities or natural transport (e.g., sediment resuspension and transport during tidal cycles and/or high winds) of contaminated sediment from unremediated areas of the harbor that are subject to dynamic sediment movement.

Shoreline soil data from the 2006–2007 monitoring period suggest that the remediation was effective, in that total PCB concentrations were below the 25 mg/kg recreational shoreline land use criteria for this area at all stations.

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1.0 INTRODUCTION

The New Bedford Harbor Superfund Site (Site), located in Bristol County, Massachusetts (MA), extends from the shallow northern reaches of the Acushnet River estuary south through the commercial harbor of New Bedford and into 17,000 adjacent acres of Buzzards Bay (Figure 1). Industrial and urban development surrounding the harbor has resulted in sediments becoming contaminated with high concentrations of many pollutants, notably polychlorinated biphenyls (PCBs) and heavy metals. Two manufacturers in the area used PCBs while producing electronic devices from the 1940s to the late 1970s, when the use of PCBs was banned by the U.S. Environmental Protection Agency (USEPA). Based on human health concerns and ecological risk assessments, USEPA added New Bedford Harbor to the National Priorities List in 1983 as a designated Superfund Site. Through an Interagency Agreement between the USEPA and the U.S. Army Corps of Engineers, New England District (USACE NAE), the USACE is responsible for carrying out the design and implementation of the remedial measures at the site. The Site has been divided into three areas – the upper, lower and outer harbors – consistent with geographical features of the area and gradients of contamination (Figure 2).

Aerovox Inc. located in New Bedford, MA used PCBs in the manufacture of electrical capacitors from approximately 1940 to 1977. This facility is located in the upper harbor and is considered one of the major sources of historic PCB contamination to New Bedford Harbor. The highest concentrations of PCBs were found in sediments in a 5-acre area in the northern portion of the Acushnet River Estuary adjacent to the Aerovox facility. These 'hot spot' sediments, which contained PCBs upwards of 100,000 milligrams per kilogram (mg/kg), were removed between 1994 and 1995 as part of USEPA's 1990 "Hot Spot" Record of Decision (ROD). Full scale remediation dredging per the 1998 Upper and Lower Harbor ROD was initiated in 2004 and continued in 2005, 2006, and 2007. Another known source of PCB contamination in New Bedford Harbor is related to activities at the Cornell-Dubilier mill on the western shore of the outer harbor (Figure 2). In 2005, a 15 acre underwater cap pilot project was implemented near Cornell-Dubilier to cap PCB-contaminated sediments.

Located at the far northern end of the Upper Harbor are areas which were prioritized for restoration activities based on their proximity to shoreline residential and recreational land use areas. The North of Wood Street (NWS) area includes in-river sediments and marsh soils on the eastern and western shores of the river. The NWS study area extends from approximately 250-ft south of the Wood Street bridge to approximately 0.25 miles north of the bridge. Sediments and marsh soils at the NWS area previously had PCB concentrations as high as 46,000 mg/kg. The 1998 ROD established the following clean up criteria: 1 mg/kg for residential shoreline areas, 10 mg/kg for the sub-tidal sediments, 25 mg/kg for the top foot of recreational land use shoreline soils and 50 mg/kg for shoreline soils deeper than the top foot in residential and recreational land use areas.

In the winter of 2002-2003 approximately 15,000 cubic yards of material was removed from the NWS area. The site was remediated using temporary dams and pumps to divert river water around the site. This allowed excavation activities to be conducted on dry sediments and soils, thus eliminating the potential for sediment resuspension and recontamination. Clean fill was

used to restore the river banks, but sub-tidal areas were left at the depth of excavation (i.e., not backfilled). Marsh and upland vegetation was planted above the low water line to stabilize and restore the shoreline. In August of 2004 post-remediation sampling revealed elevated PCB concentrations on the eastern shoreline of the NWS area, and in certain sub-tidal locations. Elevated concentrations were found above the high tide line suggesting that incomplete remediation was a more likely cause than recontamination from in-river sources. Additional remediation and restoration efforts were conducted in December 2005 to remove the remaining contamination. Samples collected before and after this effort showed an improvement in shoreline PCB concentrations (ENSR, 2006).

Additional sampling was conducted in 2006 and 2007 to assess the effectiveness of prior remediation and potential recontamination of this area due to sediment transport from unremediated areas. Twenty-one (21) locations were sampled, including 14 sediment stations in the river, 5 soil locations in the remediated marsh area on the east side of the river south of River View Park, and 2 shoreline stations on the lumber yard site on the west side of the river (Figure 3).

This report presents results from the November/December 2007 investigation and evaluates the results with respect to earlier investigations conducted at the NWS area. A description of the 2007 sampling and analysis methods is provided in Section 2.0. Results of the 2007 investigation, including physical characteristics of the river sediment and shoreline soils and sample chemistry, are provided in Section 3.0. A discussion of the NWS results is provided in Section 4.0. References are provided in Section 5.0

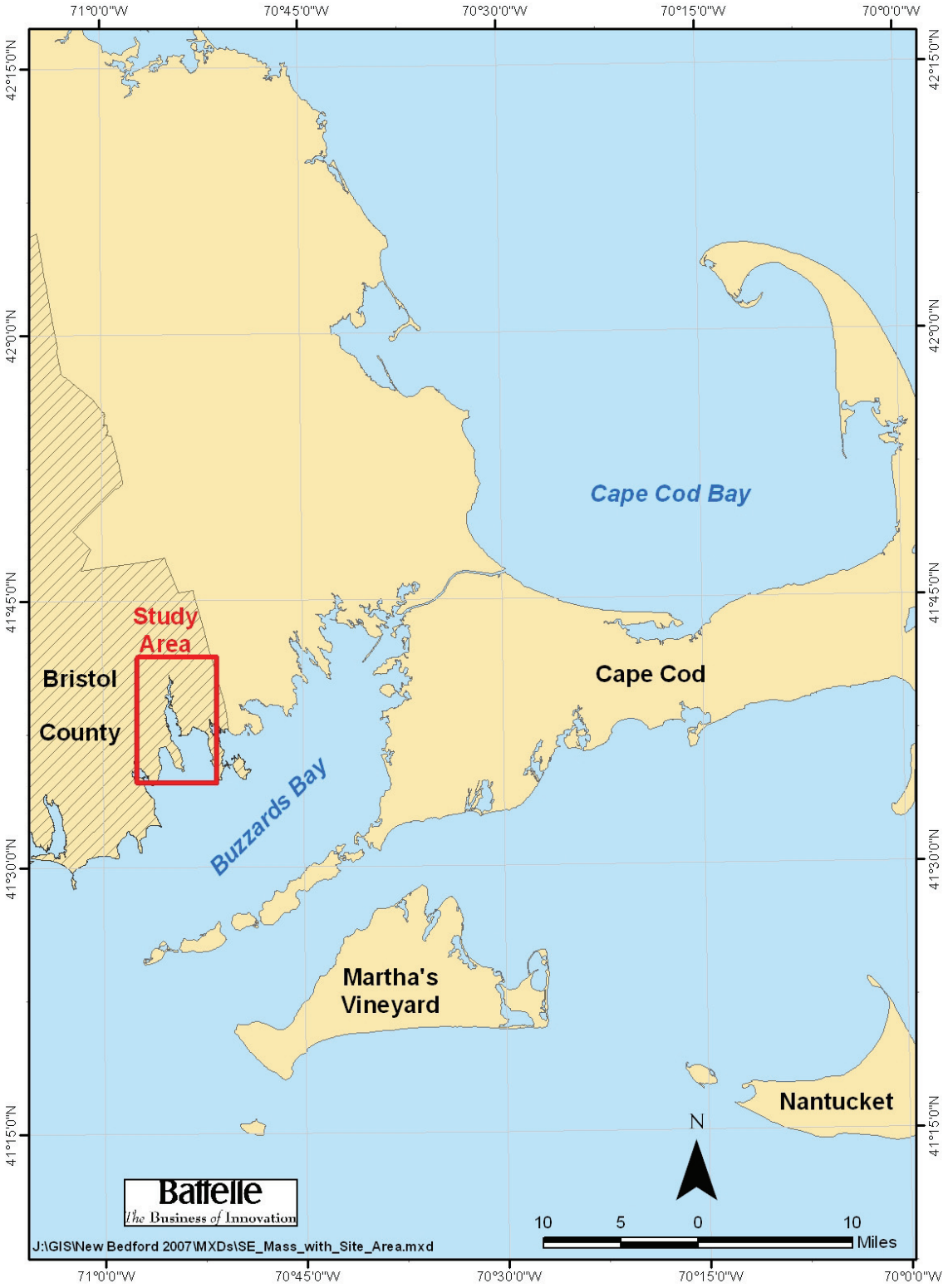

Figure 1. Location of the Site in Southeastern, MA.

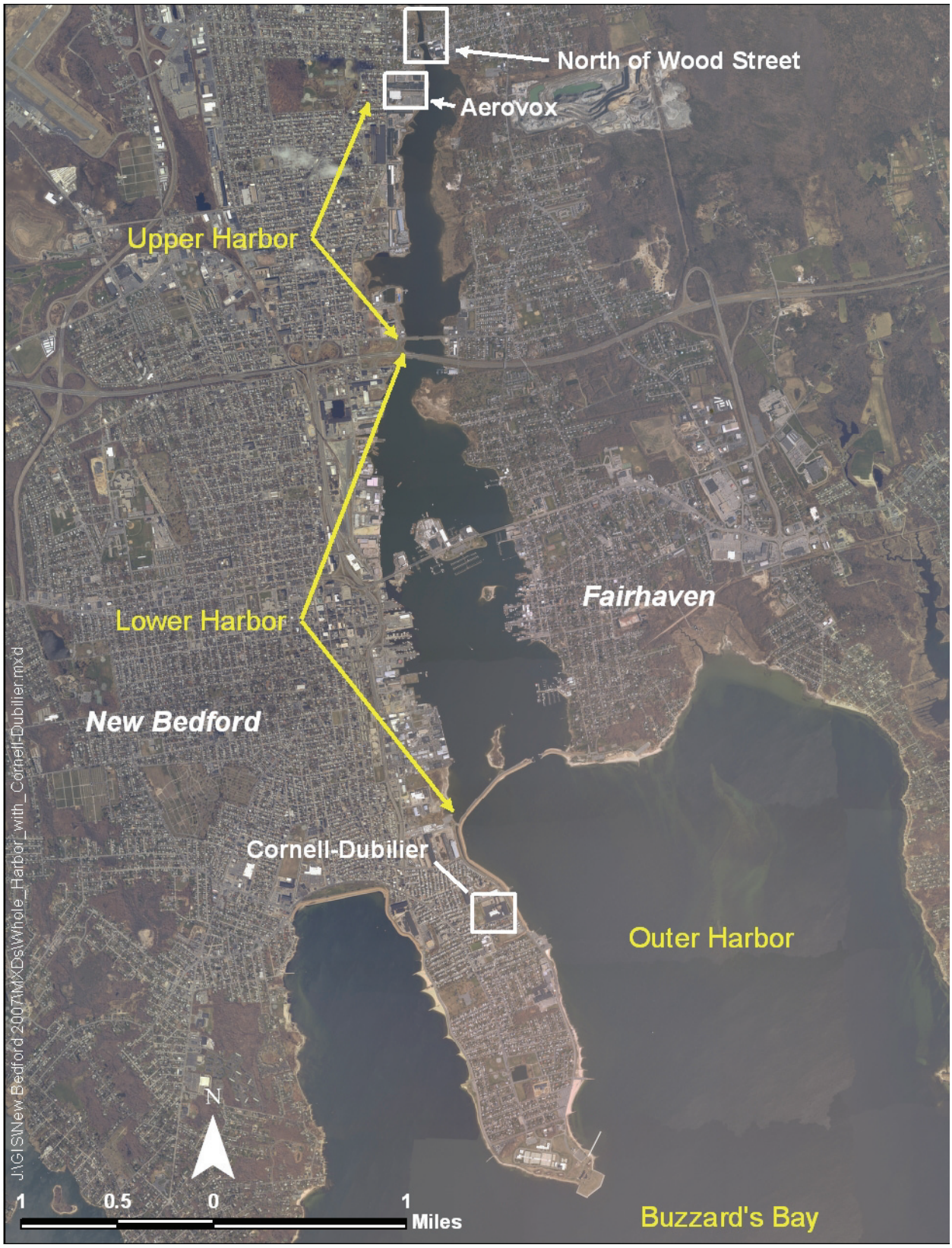

Figure 2. New Bedford Harbor Project Areas.

Figure 3. Locations of 2007 NWS Sampling Stations

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2.0 METHODS

Environmental sampling and analysis methods utilized for the November/December 2007 investigation are summarized below and described in detail in the project work plans (Battelle, 2006a, b, and c). Twenty-one (21) locations were sampled in 2007, including 14 sediment stations in the river and 7 soil stations located at recreational land use shoreline soil areas along the east and west side of the river (Figure 3). Station locations were based on locations sampled previously in 2006.

2.1 Sediment and Shoreline Soil Collections

In-river sediments were collected in Lexan™ core barrels attached to a stainless steel push core sampler. In all cases, a one foot core was targeted. Samples in deeper waters were collected from a boat, while shallow water samples were collected by wading. The push core sampler is designed to securely hold one end of a pre-cut length of core barrel. The stainless steel socket which holds the core liner was attached to a suitable length of push rod based on the water depths for the sampling effort. A piston assembly inside the core barrel was used to create suction during retrieval of the sample so that no sediment was lost from the bottom the barrel. The piston assembly was positioned just inside the leading end of the core liner and the piston line was held loosely on deck. The device was lowered into the water until the leading end of the core bore barrel contacted the sediment surface. The piston attachment line was then tied off securely on the deck, thus fixing the elevation of the piston assembly. In driving the push-core into the sediment, the piston created a syringe effect as the core liner was driven past the fixed elevation of the piston. The sampler was recovered onto the deck of the survey vessel. The bottom end of the core barrel was fitted with a plastic cap, after which the sediment on the external body of the sampler was rinsed off. After thoroughly cleaning the sampling device the core liner was removed from the socket assembly, the piston assembly was then removed, and the top of the core liner was fitted with a plastic end cap. Shoreline soil samples were collected in Lexan™ core barrels inserted into a soil auger. Sample collection data, including collection date and time, station coordinates, and sample ID, were documented on Sediment Sampling Log forms. All cores were kept intact in the liners and returned to the Sawyer Street field trailer for processing (Section 2.2).

2.2 Core Processing

Core processing was performed at the Sawyer Street field trailer. Each core was photo-documented, visually characterized, and subsampled for chemical analysis.

All cores were documented with digital photographs. Digital photographs of the cores were uploaded to the New Bedford Harbor project database. These photographs are linked in the database to the location information and to the analytical results and can be viewed individually. Each photograph contains the following elements in the frame:

- *The sediment core*. Photographing was done through the clear liner.
- *Measurement reference*. A tape measure (or equivalent) marked in decimal feet ran parallel to length of the core.

- *Sample identifier*. A card, paper, whiteboard, or equivalent was placed next to the core with the following written information:
    - Sample ID – an alpha numeric code that identifies sample matrix, sampling year, station location, and depth interval sampled
    - Sample Collection Date

Each core was visually characterized and physical characteristics, including material type, color, consistency, particle size, and odor, was documented on the Sediment Sampling Log forms. Each core was then subsampled for chemical analysis. Two 6-inch composite samples were taken from each core, homogenized, and placed into sample containers. The sample from the 0.0 – 0.5 foot interval was submitted for PCB analysis. The sample from the 0.5 – 1.0-foot interval was frozen and archived at the Site until further notice. Samples were collected into pre-cleaned, 8-oz glass jars with Teflon lined lids. All samples were held on ice while in the field and frozen upon receipt at the laboratory. Copies of the sample field logs and custody records are maintained with the project files at Battelle.

2.3 Chemical Analysis

All river sediment and shoreline soil samples were analyzed for PCB congeners and a subset of the samples were also analyzed for PCB homologues. PCB analyses were performed by Battelle, located in Duxbury, MA. Samples were mixed in the container, and approximately 10 g was removed, placed on aluminum foil, and air-dried overnight in a fume hood to ensure percent solids in the samples were >50%. Approximately 5 g of the air-dried sample was spiked with surrogates and extracted using Accelerated Solvent Extraction (ASE) following modified EPA Method 3545. The extracts were processed through activated copper for sulfur removal and then received disposable Florisil column clean-up. The post-Florisil extract was concentrated, fortified with internal standards (IS), and submitted for analysis.

All sample extracts were analyzed for the 18 NOAA PCB congeners using gas chromatography/ electron capture detection (GC/ECD) using dual column confirmation, following modified EPA Method 8082. Sample data were quantified by the method of internal standards, using the IS compounds. Positive congener results were confirmed by a secondary column confirmation analysis with the higher of the two results reported, unless analyst discretion required otherwise (e.g. the result without an interference signal was reported).

Approximately 7.5% of the samples were analyzed for PCB homologues using gas chromatography/mass spectrometry (GC/MS), following modified EPA Method 8270C. Sample data were quantified by the method of internal standards, using the IS compounds.

PCB congener and homologue results are reported in mg/kg dry weight and to two significant figures in this report. Concentrations of total PCB were calculated using the congener and homologue results. First, total PCB was calculated as the sum of the 18 NOAA congeners multiplied by the project-specific factor of 2.6. Next, total PCB was calculated as the sum of the homologues. A value of zero (0) was used in the summation for non-detects.

3.0 RESULTS

3.1 Sediment and Shoreline Soil Collections

A total of 15 surface sediment samples (14 field samples + 1 field duplicate) were collected from the Acushnet River in the NWS area (Figure 3). A total of eight shoreline soil samples (seven field samples + one field duplicate) were also collected; five samples were collected from the eastern shoreline and two from the western shoreline (Figure 3). Sample collection data, including station ID, collection date and station coordinates are summarized in Table 1.

Table 1. Summary of Samples Collected at the NWS Area, November/December 2007.

Station ID	Sample Type	Collection Date	Collection Time	Northing (NAD 83 MA ft)	Easting (NAD 83 MA ft)
C007-010	River Sediment	11/14/2007	10:28	2709127	815353
C007-016		11/9/2007	8:21	2708950	815396
C007-023		11/9/2007	8:38	2708814	815411
C007-028		11/9/2007	8:55	2708703	815400
C007-030E		11/8/2007	13:24	2708683	815499
C007-030W		11/9/2007	11:44	2708653	815363
C007-033		11/12/2007	11:33	2708614	815412
C007-038		11/9/2007	9:53	2708516	815383
C007-039		11/9/2007	9:30	2708513	815412
C007-040		11/9/2007	9:19	2708514	815462
C007-048		11/14/2007	9:16	2708385	815413
C007-049		11/14/2007	9:30	2708402	815468
C007-049 Dup		11/14/2007	9:37	2708402	815468
C007-055		11/14/2007	9:04	2708267	815460
C007-062		11/14/2007	8:50	2708165	815565
07-NWS-33	Shoreline Soil	11/9/2007	10:58	2709040	815330
07-NWS-34		11/9/2007	11:15	2708923	815338
07-NWS-35		11/8/2007	12:28	2708761	815503
07-NWS-36		11/8/2007	12:12	2708761	815516
07-NWS-37		11/8/2007	12:40	2708682	815535
07-NWS-38		11/8/2007	13:45	2708819	815500
07-NWS-39		12/6/2007	11:45	2708819	815509
07-NWS-39 Dup		12/6/2007	11:50	2708819	815509

3.2 Physical Characteristics

River sediments and shoreline soils were visually characterized and physical characteristics, including material type, color, consistency, particle size, and odor, are documented on the Sediment Sampling Log forms provided in Appendix A. Digital photographs of the cores are also provided in Appendix A.

3.2.1 River Sediments

The physical characteristics of surface sediments collected at most river stations were similar, and were characterized by a layer (0.2 – 0.8 feet) of fine black silt underlain by sand, clay or silt. The physical characteristics of sediment located closer to the shoreline and further upstream were different compared to in-river sediment locations. For example, station C007-030W, located near the western shore of the river, was comprised of medium to fine, brown sand with organic material underlain by sand. Station C007-030E, located near the eastern shore of the river, was comprised of fine to coarse, dark brown organic sand and silt underlain by gravel and sand. Station C007-010, located at the northern boundary of the NWS area, was comprised of fine to coarse, grey-black sand and gravel.

3.2.2 Shoreline Soils

Soils located along the western shore were generally comprised of fine to medium, firm brown organic material with sand underlain by sand. Soils located along the eastern shore were generally comprised of fine to coarse, loose brown organic silt and sand underlain by gravel, silt and sand. Shoreline soils at stations NWS-34, NWS-35, and NWS-37 had a more uniform composition within the top one foot.

3.3 Polychlorinated Biphenyls

Total PCB concentrations measured in river sediments and shoreline soils collected at the NWS area in November/December 2007 are summarized in Table 2 and shown in Figure 4. Complete PCB congener and homologue results are provided in Appendix B.

Table 2. Total PCB Concentrations in Sediment and Shoreline Soil at the NWS Area, November/December 2007

River Sediment		Shoreline Soil	
Station ID	Total PCB (a) (mg/kg dry)	Station ID	Total PCB (a) (mg/kg dry)
C007-010	4.5	07-NWS-33	0.089
C007-016	29	07-NWS-34	7.4
C007-023	23	07-NWS-35	0.19
C007-028	78	07-NWS-36	0.31
C007-030E	0.44	07-NWS-37	4.5
C007-030W	0.4	07-NWS-38	0.26
C007-033	120	07-NWS-39	0.035
C007-038	68	07-NWS-39 Dup	0.06
C007-039	270		
C007-040	20		
C007-048	43		
C007-049	25		
C007-049 Dup	32		
C007-055	190		
C007-062	23		

(a) Sum of 18 congeners x 2.6

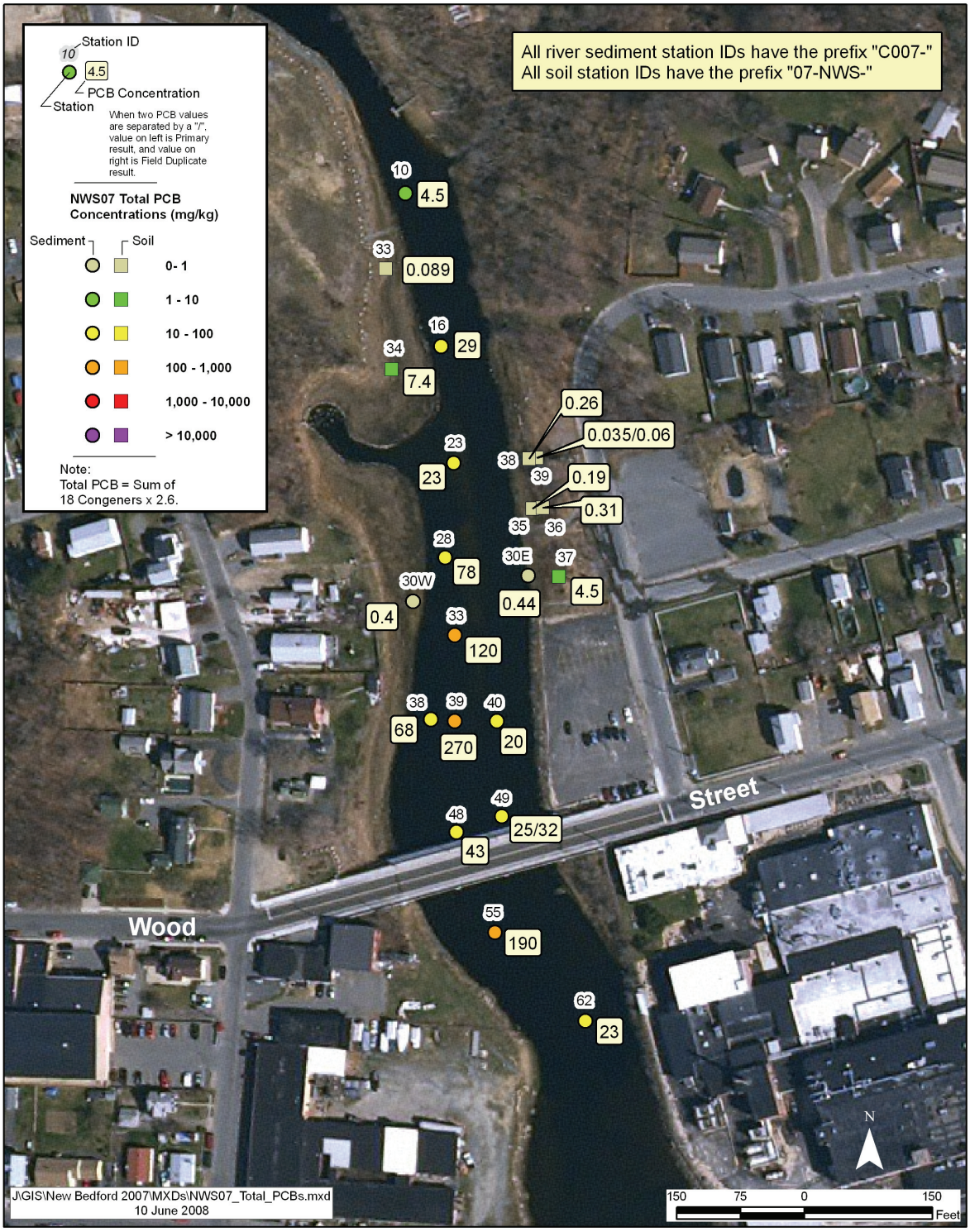

Figure 4. Total PCB Concentrations in River Sediment and Shoreline Soil Samples at the NWS Area, November/December 2007

3.3.1 River Sediments

Total PCB concentrations in river sediment samples ranged from 0.4 mg/kg to 270 mg/kg (Table 2). The highest concentrations of total PCB (> 100 mg/kg) were measured in surface sediment at station C007-039, followed by C007-055, and C007-033 (Figure 4). Lower concentrations of total PCB (< 5 mg/kg) were measured in sediment collected closer to the shoreline (C007-030W and C007-030E) and further upstream (C007-010) (Figure 4, Table 2).

3.3.2 Shoreline Soils

Total PCB concentrations in the shoreline soils ranged from 0.035 mg/kg to 7.4 mg/kg (Table 2). The highest concentrations of total PCB were measured in surface soil at station 07-NWS-34 (7.4 mg/kg), located on the west shore (Figure 4). The next highest concentration of total PCB was measured in surface soil at station 07-NWS-37 (4.5 mg/kg), located on the east shore (Figure 4). Total PCB concentrations were below 1 mg/kg in all other surface soil samples (Table 2).

3.4 PCB Homologue Comparison

All river sediment and shoreline soils were analyzed for PCB congeners and 3 of the 23 samples (2 river sediment and 1 shoreline soil) were also analyzed for PCB homologues. A comparison of the total PCB concentrations, calculated using both the congener and homologue data, is summarized in Table 3. Total PCB concentrations calculated by both methods are comparable for two of the three samples. Total PCB concentrations are considerably different for one of samples, with a higher value calculated using the congener method (Table 3). A larger number of samples from the harbor-wide sediment program were collected for congener-homologue comparison and those data are discussed in the Sediment Monitoring Summary Report for 2007 Remedial Dredging (Battelle, 2008).

Table 3. Total PCB Concentrations Calculated by Congener and Homologue Results

Station ID	Sample Type	Total PCB (mg/kg dry)		
		Sum 18 Congeners (a)	Sum Homologue (b)	RPD
C007-016	River Sediment	29	30	3.4
C007-039		270	160	51
07-NWS-34	Shoreline Soil	7.4	6.9	7.0

(a) Sum of 18 congeners x 2.6, non-detect = 0 mg/kg.
(b) Sum of 10 homologue groups, non-detect = 0 mg/kg.
RPD, relative percent difference.

4.0 DISCUSSION

Several investigations have been conducted to characterize PCB contamination at the NWS area following remediation activities conducted in 2002-2003 to remove PCB-contaminated sediments and soils from the river and surrounding shoreline (TTFW, 2004). A confirmatory sampling event was conducted by TTFW immediately following the remediation in February 2003 (see North of Wood Street Cleanup Zone Map, available at http://www.epa.gov/ne/nbh/). ENSR conducted four sampling events in the area to evaluate changes in river sediment PCB concentrations that may have occurred due to seasonal influence and/or dredging/ remediation activities, as follows: August 2004 (pre-dredging), May 2005 (spring flow conditions), September 2005 (pre-dredging, late summer flow), and January 2006 (post-dredging). Battelle conducted two post-dredging sampling events in November 2006 and November/December 2007 to further assess potential recontamination of the NWS area.

4.1 River Sediments

Total PCB concentrations measured in river sediments at the NWS area between 2003 and 2007 are summarized in Table 4. Station-specific and system-wide average[1] concentrations of total PCB between 2003 and 2007 are shown in Figures 5 and 6, respectively. Sediment data from the 2003–2007 monitoring period show that total PCB concentrations in river sediment at the NWS area are spatially and temporally variable (Figures 5 and 6), which makes it difficult to discern clear trends in the data. The lowest concentrations of total PCB in river sediment were measured in 2003, immediately following the remediation of the NWS area in the winter of 2002-2003 (Figures 5 and 6). A post-remediation increase in total PCB concentrations was observed in 2004 (Figures 5 and 6). While total PCB concentrations decreased in subsequent sampling events, post-remediation levels in 2007 remain elevated at most stations compared to 2003 (Figure 5). The post-remediation increase between 2003 and 2007 was small[2] at some stations (C007-016, 023, 040, 049, 062) and larger[3] at other stations (C007-028, 033, 038, 039, 048, and 055) (Figure 5). System-wide average concentrations of total PCB in sediment at the NWS area have decreased since the 2004 post-remediation increase, and have ranged[4] from 16 mg/kg in 2005 to 53 mg/kg in 2007.

The NWS area is characterized by heterogeneous sediments, and the variability among the PCB data likely reflects differences in bulk sediment characteristics (e.g., grain size and organic carbon content). The NWS area is also subject to dynamic sediment movement, and the apparent increase in PCB concentrations at some stations could have resulted from contaminant transport from the upper harbor during dredging activities or natural transport (i.e., non-dredging related such as sediment resuspension and transport during tidal cycles and/or high winds) of contaminated sediment from unremediated areas. Annual sediment monitoring will continue at the NWS area as needed to assess the potential for recontamination from the unremediated harbor areas immediately to the south.

[1] The system-wide concentration is an area-wide average concentration calculated as the average PCB concentration across all stations within a given sampling event.
[2] Small increase - 2007 values typically less than six times 2003 values.
[3] Larger increase – 2007 values typically two orders of magnitude higher compared to 2003 values.
[4] Range values are based on ‘common’ set of stations sampled consistently across all sampling events.

Table 4. Total PCB Concentrations in River Sediment at the NWS Area, 2003 to 2007.

Station ID	Total PCB (a) (mg/kg dry)						
	Jan/Feb-2003	Aug-2004	May-2005	Sep-2005	Jan-2006	Nov-2006	Nov/Dec-2007
C007-010	6.1D	20	-	81	0.99	2.4	4.5
C007-016	4.6D	13	-	18	16	15	29/30[(c)]
C007-023	8.3D	22	3.8	2	6.6	8.5	23
C007-028	0.49DU	63	9.8	0.22	11	18	78
C007-030E	-	-	-	0.7 (b)	88	0.72	0.44
C007-030W	-	-	-	0.4 (b)	5.2	0.16	0.4
C007-033	0.39DU	64	22	1.1	17	93	120
C007-038	0.45DU	36	-	4.7	8.6	1.8	68
C007-039	0.54DU	64	4.6	-	-	13	270/160[(c)]
C007-040	2.9D	72	79	73	190	47	20
C007-048	0.43DU	23	9	-	-	100	43
C007-049	12D	160	36	5.9	3.6	12	25
C007-055	0.42DU	61	-	7	20	9.6	190
C007-062	7.4D	19	-	0.87	1.3	40	23

D: result from dilution analysis; U: non-detect, detection limit reported.
(a) Sum of 18 congeners x 2.6
(b) Data were not in the New Bedford Harbor Database. Total PCB values from ENSR (2006).
(c) Total PCB result based on homologue analysis (see Table 3).

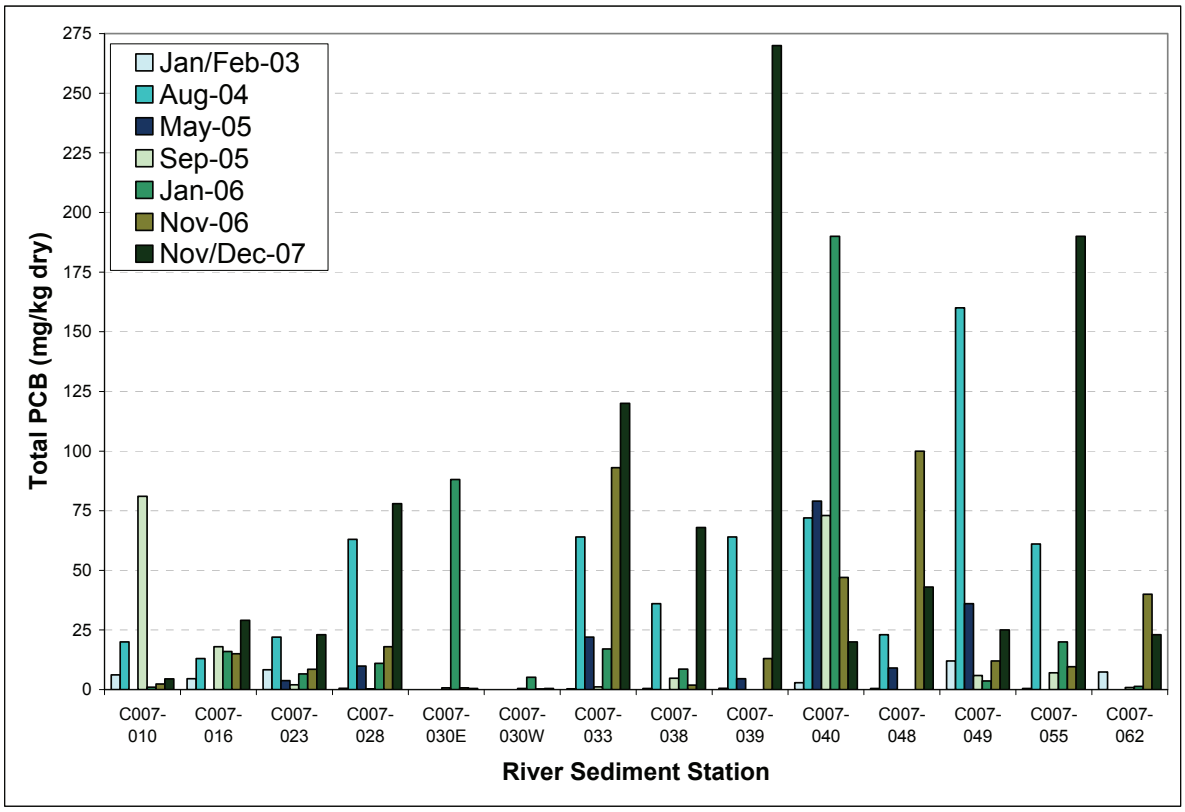

Figure 5. Station-specific Trends in Total PCB Concentrations in Sediment at the NWS Area, 2003 to 2007

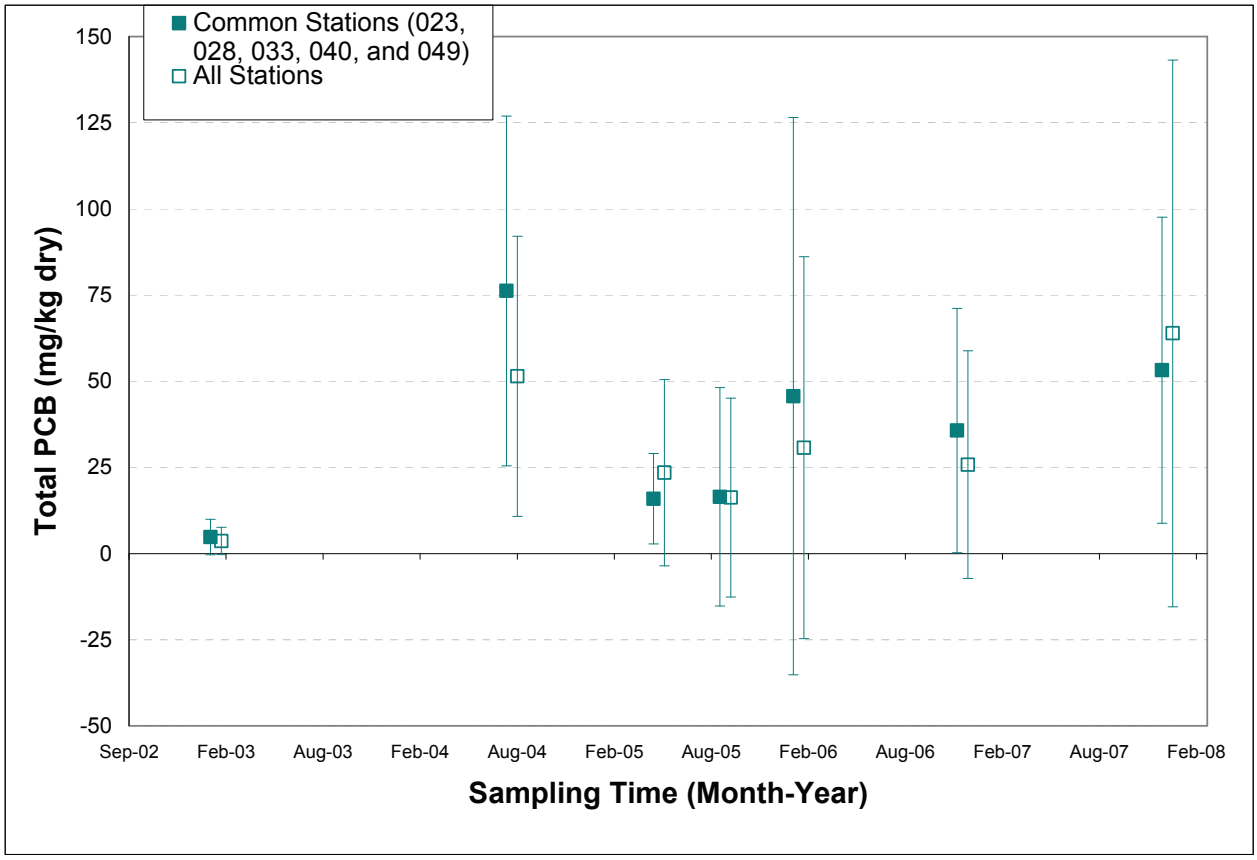

Figure 6. System-wide Trends in Total PCB Concentrations in Sediment at the NWS Area, 2003 to 2007. The system-wide concentration is the average concentration of all data for a given sampling event. System-wide average concentrations are presented for 'common stations'and 'all stations'. Common stations are a sub-set of the sampling stations that were sampled consistently across all sampling events (i.e., C007-023, 028, 033, 040, and 049). The 'all station' average is based on all available data from all stations (the number of stations sampled varies by sampling event, ranging from 7 stations sampled in 2003 to 14 stations sampled in 2006 and 2007). The errors bars represent one standard deviation.

4.2 Shoreline Soils

Total PCB concentrations in shoreline soils is summarized in Table 5 and shown in Figure 7. In December 2005, Jacobs Engineering performed additional remediation at the eastern shoreline of the NWS area to remove contaminated soils/sediments that were inadvertently missed during the 2002-2003 remediation. PCB results from post-remediation sampling conducted in 2006 and 2007 suggest that the remediation was effective, in that total PCB concentrations were below the 25 mg/kg recreational shoreline land use criteria for this area at all stations (Table 5, Figure 7). Substantive changes in shoreline total PCB concentrations between the 2006 and 2007 sampling events were not observed, except at station NWS-37 where the concentration increased by an order of magnitude in 2007 compared to 2006. Even so, the PCB concentration measured in 2007 was well below the 25 mg/kg cleanup criteria for this area.

Table 5. Total PCB Concentrations in Shoreline Soil at the NWS Area, 2006 and 2007.

Station	Total PCB (a) (mg/kg dry)	
	Nov-2006	Nov/Dec-2007
Western Shoreline		
07-NWS-33	0.014	0.089
07-NWS-34	3.4	7.4
Eastern Shoreline		
07-NWS-35	0.27	0.19
07-NWS-36	0.14	0.31
07-NWS-37	0.35	4.5
07-NWS-38	0.15	0.26
07-NWS-39	0.082	0.035
07-NWS-39 Dup	-	0.06

(a) Sum of 18 congeners x 2.6

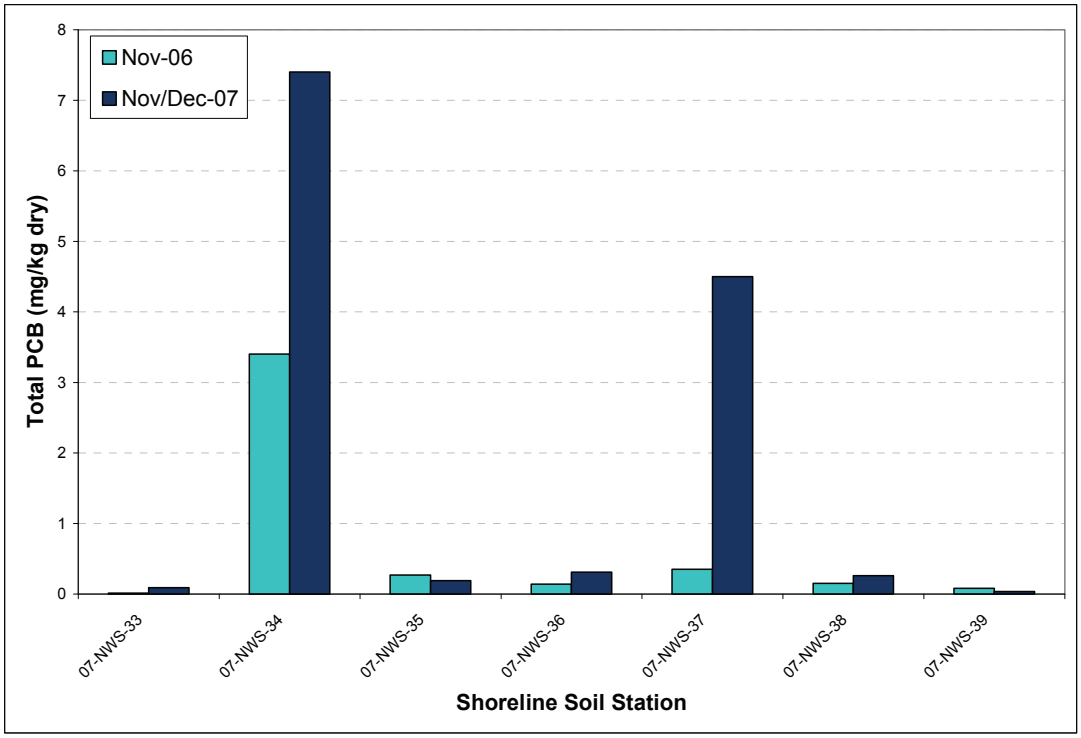

Figure 7. Total PCB Concentrations in Shoreline Soil at the NWS Area, 2006 and 2007 Post-remediation Sampling Events

5.0 REFERENCES

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